MAY/JUNE '85

$3.00

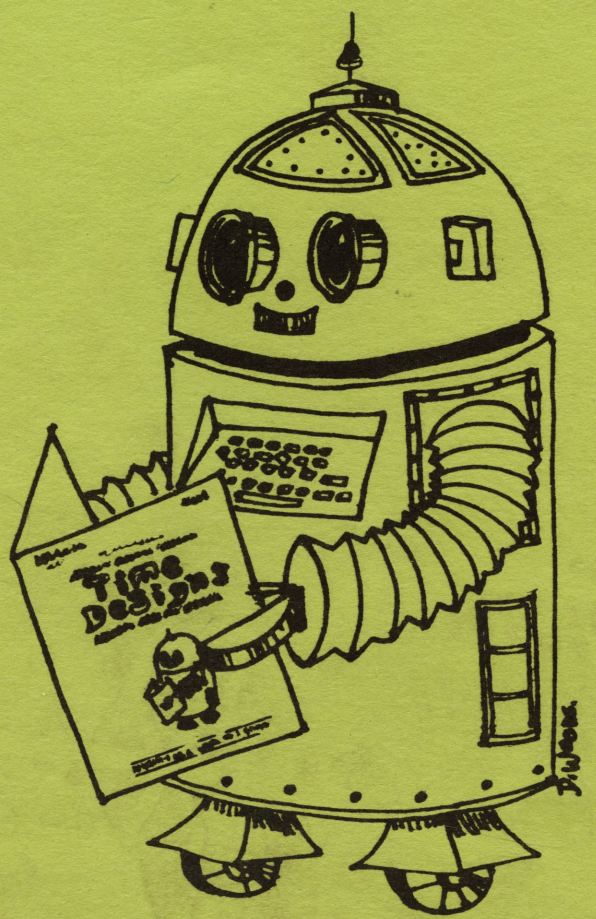
VOL. 1 NO. 4

FOR THE T/S 2068 AND ALL OTHER
TIMEX AND SINCLAIR COMPUTERS

U.S. FUNDS

Time Designs™

MAGAZINE

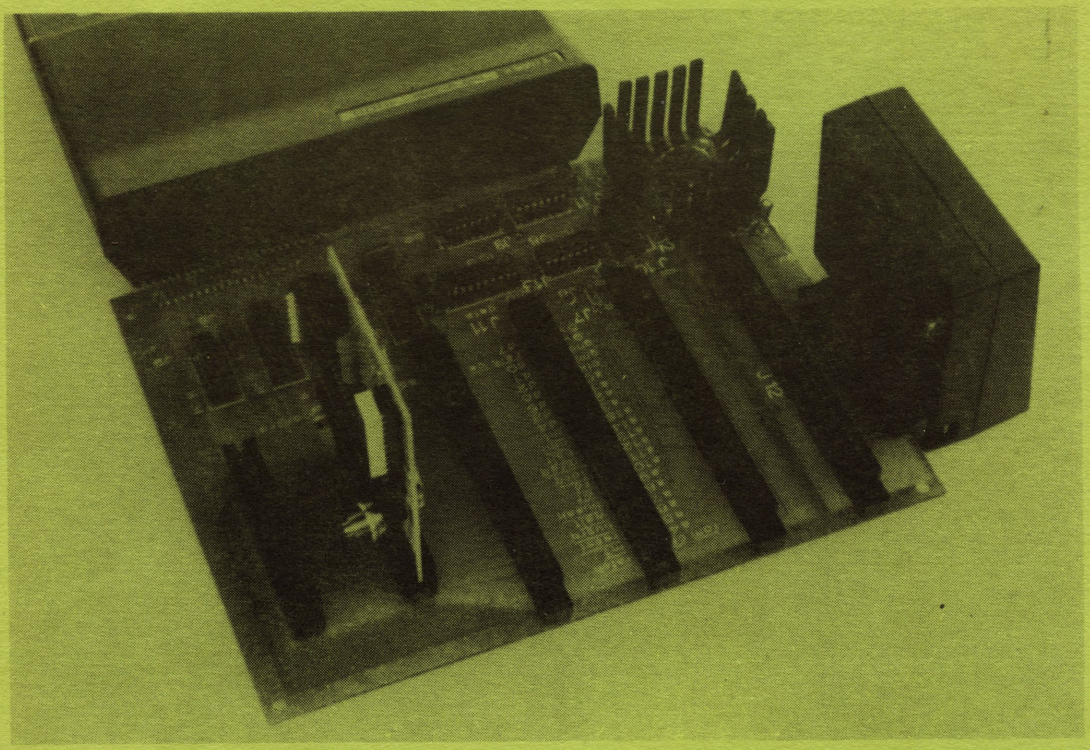


2068 is COMING BACK!

DETAILS INSIDE

INTRODUCTION TO COMPUTER CONTROL

BUDGET ROBOTICS & COMPUTING, BOX 18616, TUCSON, ARIZONA 85731



Above shows fully populated BUFFERED BUSS EXPANSION BOARD and RX-81 PARALLEL I/O BOARD plugged into TS1000 with 16K RAM. 5 volt 3 amp regulator (top right), buffer/decoder ICs (across top), six expansion connector points (across bottom) with RX-81 I/O board plugged into expansion point second from left.

BUFFERED BUSS EXPANSION BOARD - 6 3/8" x 8 1/4" double sided/ plated thru holes/Parts list/documentation/90 degree connector. For ZX80, ZX81, TS1000 & TS1500. Versions available:

'EXP-1' Bare board version	$40
'EXP-1A' Fully populated kit	$80
'EXP-1B' Economy kit	$62
(add EXP-1R and EXP-1C later for a fully populated board)	
'EXP-1R' 5 volt/3 amp regulator kit(use with EXP-1B or EXP-1)	$7
'EXP-1C' Extra connectors(use with EXP-1B or EXP-1)	$11

RX-81 Parallel I/O board - 2 3/8" x 3" double sided/plated thru holes/Parts list/documentation. For ZX80, ZX81, TS1000, TS1500 & TS2068. Versions available:

'RX-81' Bare board	$10
'RX-81A' Fully populated kit	$25
(plugs into computer's rear expansion slot)	
'RX-81B' Fully populated kit, minus connector	$21
(plugs into BUFFERED BUSS EXPANSION BOARD)	
'RX-81C' Demo/test kit	$4
(LED array and DIP switch for output and input demo/test)	

Order by alpha-numeric abbreviation (i.e. 'EXP-1B'). Postage & handling to U.S. and Canada included. Overseas add 10%. Send check or money order (U.S. dollars) allow check clearance time.

BUDGET ROBOTICS & COMPUTING, BOX 18616, TUCSON, AZ 85731

FOR THE T/S 2068 AND ALL OTHER
TIMEX AND SINCLAIR COMPUTERS

Time Designs T.M.

MAGAZINE

MAY/JUNE '85

VOL.1 NO.4

Published by:

TIME DESIGNS MAGAZINE CO.
29722 Hult Rd.
Colton, Oregon 97017
(503) 824-2658

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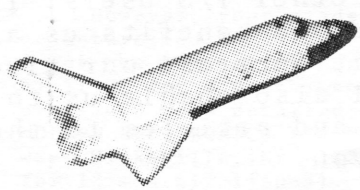
Subscriptions: $15 for one year (six issues) in U.S. funds only. 3rd class bulk rate postage is paid for by T.D.M.C. permit no. 51, Colton, Oregon.



INSIDE

Editor's Corner..... 2
Letters To The Editor..... 3
Bits And Pieces..... 4
SPECIAL REPORT: 2068 Is Returning To The U.S..... 6
Introduction To Computer Control..... 7
Machine Code Joystick Routine.....10
2068 Color Demo.....11
A Graphics Problem For The T/S 2068....12
2068 Program: Slot Machine.....14
VAMP TV To Monitor Kit.....16
Tasword Two Tips.....16
PRO/FILE 2068.....17
Coupon Magic.....18
The Dealer's Den.....18
Damco/Rotronics Wafadrive Reviewed.....19
TS 2068/Spectrum-Wares.....21
The Shopping Mart.....22

on the cover: The intelligent computer-controlled droid on this issue's cover was designed and drawn by Debbie Woods, an artist from San Jose, California.

Editor's Corner

I recently returned from a trip to California. Sinclair computing is alive and well in that large west coast state, and I was able to visit with some interesting T/S enthusiasts (in-person and a few on the phone). Jerry Chamkif, president of Aerco in Austin, Texas was also in California on business (and vacation) at the same time as I was, but unfortunately our paths never crossed. Jerry demonstrated his new 2068 Disc System at the San Francisco Users Group meeting. There were some problems with the disk software and the system crashed a few times. This has been corrected with some help from Jack Dohany of Menlo Park, CA. Aerco started shipping Disc Systems and Interfaces on April 12.

My first stop was Sunset Electronics down by the waterfront in San Francisco, to meet with owner and proprietor John Warburton. This is one of the few actual stores in the U.S. that deal in Timex Computer Equipment and Accessories. I even found Time Designs Magazine on the book rack there. Sunset Electronics also does a large mail order business (32 page catalog available upon request. Write to: 2254 Taraval St., San Francisco, CA, 94116). John and some other T/S users in the Bay Area were preparing for the annual West Coast Computer Faire on March 30-April 2. Arrangements had been made with Sinclair to show a QL there.

Down the Peninsula a few miles, in the Silicon Valley I found the manufacturing and operating facility of A & J Micro Drive. Jim Howell is the "man-in-charge" here, and they have recently introduced a stringy-floppy system for the stock T/S 2068. Along with Jim, there are 10 other employees who assemble and test the drives and wafers. A & J's biggest business is drives and interfaces for various models of electronic typewriters on the market. While I was there, Jim told me that he had purchased the rights and equipment of the wafer technology used in the T/S 1000 Micro Drive from Entrepo (the inventors). A & J will now incorporate the model 1000 style wafers (version 0) and drives into the model 2000 for the T/S 2068. The original model 2000 used a different wafer (version 2) and are not compatible with the new units being shipped. On the outside the model 2000 Micro Drive will remain the same.

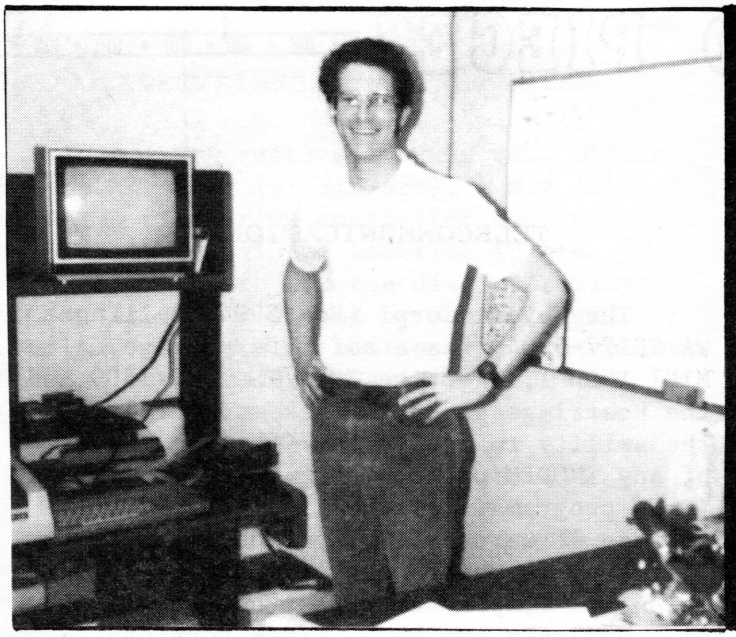
Before heading south, I chatted on the phone with Bob Orrfelt of Redwood City, CA and also Rita Carr, who is the chairperson of the Silicon Valley T/S Users Group. Bob Orrfelt has his own cottage industry and offers a 64 Col. Word Processor for the 2068, and some nifty new EPROM Cartridge Boards. Among some other things he has been working on is fixing up the "bugs" in the 2068's ROM. Bob may be contributing some information for Time Designs readers in an upcoming issue.

Down in Los Angeles, home of congested freeways, smog and Mickey Mouse...I met with Sinclair computer expert Dave Clifford. Dave wrote a review in our last issue on the Z-Link interface card. He is also very knowledgeable on telecommunications using the Westridge 2050 Modem and MTERM II Software. Dave demonsrated his Sinclair Microdrives on the 2068 for me. They are very compact little units, but also very fast!

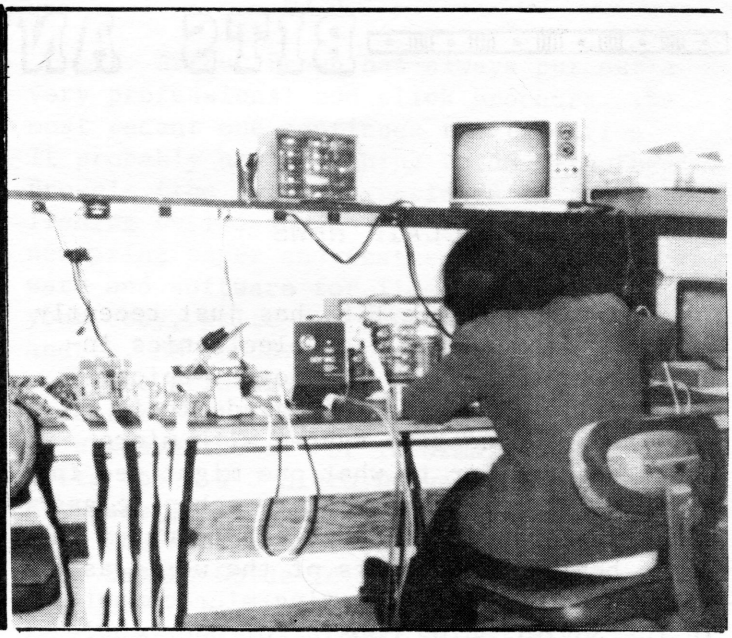
Well here we are back "home". And before closing, I want to say thank you to all of you who have mentioned or shown your copy of Time Designs to other T/S users. It is appreciated and benefits us all. Not only does it increase our circulation, but it will also enable us to add more pages and articles to the magazine for you.

See you next issue!

Tim Woods/Editor



Jim Howell in his office at A & J Microdrive in Sunnyvale, California.



An unidentified employee assembles Model 2000 Microdrive units for the Timex 2068. Circuit boards and ribbon cables are shown on the left.

letters to the editor

Send your correspondence to: Time Designs Magazine, C/O The Editor, 29722 Hult Rd., Colton, OR 97017.

Dear Tim,

Yesterday, as one of the guest speakers at the bi-monthly meeting of the West Los Angeles ZX81 Users Group, I received a complimentary copy of the March/April '85 issue of Time Designs through the cooperation of Ed Gray.

What a nice job you're doing! I found your magazine contained lots of useful material, was clearly printed, and reasonably free of typos. The reproduction of LISTings, photos and graphics was particularly good compared to most other Timex/Sinclair publications (mostly newsletters).

My personal involvement in the Sinclair/Timex world has been minimal since I completed my Howard W. Sams book on the 2068 almost two years ago ("TIMEX SINCLAIR 2068 BEGINNER/INTERMEDIATE GUIDE"). I've since written three other books- the "awful" ADAM, the "spectacular" Sanyo MBC 550 Series, and the "rotten" Apple //c. (Those quotes represent my one-word reaction to the computer.

However, your readers might be interested that last December I got the loan of an English Sinclair QL for a month, and did an over-7000 word detailed review for MODERN ELECTRONICS (76 North Broadway, Hicksville, NY 11801, $12.97 for 12 monthly issues). This slick new magazine (8 issues so far) is about 100 pages per issue, and covers the whole field of electronics for hobbyists and experimenters, with considerable computer coverage. They have scheduled the QL as the cover story of the June issue, which comes out in May, pending FCC approval of the U.S. QL (which is expected any day.....)

Sincerely,
Fred Blechman
Canoga Park, CA

(EDITOR- Thank you very much Fred for the nice compliments about TIME DESIGNS. We keep trying. Our readers, I am sure were interested in hearing what you were up to lately. Many of them have your Howard W. Sams book on the T/S 2068. Also, I would like to mention to our readers that you have agreed to contribute some info on the QL in a future issue of TIME DESIGNS.)

Gentlemen,

Thanks for your copy of VOL 1, NO 3. Very well Executed! Being a ZX81 owner, I do hope you will not forget us.

Sincerely,
L. Chavarie
Ottawa, Ontario
Canada

(EDITOR- We certainly won't forget you. ZX81 users have received a lot of criticsm in the past, but Bruce C. Taylor's article on computer control in this issue, affirms what a very powerful little computer it is. We will give you more programs and articles in the future.)

BITS AND PIECES

SINCLAIR NEWS

Sinclair of the U.K. has just recently returned from a couple of electronics industry trade shows in the Soviet Union. The Kremlin is trying to upgrade their culture and education system with microcomputers similar to what one might see in a typical American elementary school classroom. The iron curtain hi-tech industry is years behind other parts of the world as far as mass production. Existing microcomputers in the Soviet Union consist of poor copies of the Apple II. Sinclair demonstrated their Spectrum Plus and QL to the eager Soviets. I wonder what they thought of "one stroke keyword commands?"

Sinclair has ceased production of the original ZX Spectrum (16k and 48k versions), and is marketing exclusively the Spectrum Plus. This computer is styled after their top-of-the-line QL. Has an improved keyboard and 48k RAM.

Speaking of the QL, Mary Reinman of Sinclair (U.S.) could not give us word of it's release as we went to press. The comment was made that FCC approval was just "a couple of weeks" away. Some experts here and abroad, claim that FCC has already approved the computer, and that Sinclair is waiting for units to ship before they announce availability.

One U.S. vendor that is patiently waiting for the release of the QL, is Curry Computer (5344 W. Banff, Glendale, AZ 85306). They have stocked a large quantity of QL software and books. They also publish a newsletter called "The QL Report". In the April '85 issue that we received, there was a sample of a QL screen display from a program called "GRAPHIQL". Very impressive.

The English computer press has not always been very kind towards the QL, and on more than one occasion remarked about it's rather "slow" operating system. However, the few individuals here in the U.S. that are fortunate to own the British QL, are very pleased with the computer and speak very favorably of it. We have yet to see what changes Sinclair made on the machine to bring it to America.

TELECOMMUNICATIONS

The Weymil Corp. (Box 5904, Bellingham, WA 98227-5904) has a software package called MINI XMOD 1.5 for the ZX81/TS 1000/1500 and the Westridge and Byte Back modems. It has the ability to access the CPM files section of any XMODEM protocol BBS to up or download Timex programs. Features include memory storage of screen displays and an indicator that reports when memory is full. Documentation and step by step instructions is included. There are both 16/64k versions. The 64k version stores easily in the Hunter Board for instant recall. Price is $20.

USERS GROUP UPDATE

Add these Timex/Sinclair Users Groups to your list. The March/April '85 issue of Time Designs carried a large directory of Groups in the U.S. and Canada. If you are a member of an active group that did not appear on this list, and would like to be mentioned, please send us the information.

Timex/Sinclair Users Group
Hughes Aircraft Company
Att: Liabrary (personal computer club)
8433 Fallbrook Ave.
Canoga Park, CA 91304
contact: Tony Gomez

N.W. Florida 2068 T/S User Group
402 Pine Terrace Circle
Milton, Florida 32570
contact: Edwin S. Salter

REPAIR CHANGES

TS Connection (3832 Watterson, Cincinatti, OH 45227) has taken over the Timex computer factory repair service previously offered by Timex in Little Rock, Arkansas. They will repair a TS 1000 for $20 maximum, and a 2068 for $40 max. The 2068 Tech Manual is also carried by TS Connection. If your computer is on the fritz, write to them at the address mentioned above, or call (513) 271-5575.

OLIGER/KINGSLEY DISC SYSTEM

In a joint venture between John Oliger and Ray Kingsley (of Sinware), a new inexpensive disc drive controller for the 2068 will be available sometime in mid June. The hardware for the disc operating system is being designed by John Oliger, while the software to boot up the controller is being programmed by Ray Kingsley. The main disc interface board is already completed. It will support up to four single or double sided, single, double or quad density 3 to 5¼ inch drives. The data transfer rate of this board (5¼-double density) is 32k bytes per second...the actual rate will be determined by the software efficiency. Software support is only planned for the 2068, and possibly the Spectrum (in the future).

Further hardware for the controller include a firmware/bank logic/memory board and/or the 64k memory/CPM board. These two boards are furthest away from production, but should be coming along soon. It is hoped that the system will respond like the Sinclair Interface One with Microdrives, and use all the BASIC supported keywords (including SAVE and LOAD). Prices on the boards are still to be determined. It should also be pointed out that the controller is designed for use with the Oliger 2068 Expansion Board.

Specific comments/suggestions concerning hardware for the system should be addressed to: The John Oliger Co., 11601 Whidbey Dr., Cumberland, IN 46229. Comments, suggestions, ect. regarding software should be addressed to: Ray Kingsley, C/O Sinware Software, P.O. Box 8032, Santa Fe, NM 87504. If you would like to be put on the system's "inform when ready" list, drop John a postcard.

Mr. Oliger also announced availability of his new 2068 Parallel Printer Port. It is a Centronics type and comes complete with software on cassette. It is also Aerco compatible as far as commercial software is concerned. It is perhaps the lowest priced printer interface of it's kind, with the fully assembled and tested version (with cable) going for $47.90. The kit with parts is $24.95 (add $16.95 for cable), and a bare board is available for $16.95 and includes the cassette. A 15 page user manual is supplied with every version.

MISC.

E. Arthur Brown has always put out a very professional and slick brochure. The most recent one continues the tradition. It probably has something to do with Eben Brown's (the owner) experience in the publishing business. The EB7 catalog is on newsprint paper and features a host of hardware and software for Timex computers. For your copy, write to: 3404 Pawnee Dr., Alexandria, MN 56308.

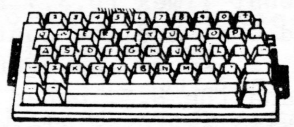
The printer interface cable and software for the A & J Model 2000 Micro Drive is now available. For information and price write to: A & J Micro Drive, Suite I, 1050 E. Duane Ave., Sunnyvale, CA 94086.

The address for the D. Lipinski Software Buyers Guide To Sinclair-Timex Products And Services, that we mentioned in the March/April '85 issue is: 2737 Susquehanna Rd., Roslyn, PA 19001. Price is $20 ppd.

Kirt Olsen, Publisher/Editor of Syntax, told Time Designs that he intends to continue publishing the newsletter. He also mentioned that Syntax (and SQ Magazine) is up for sale. The last newsletter that Kirt put out was the November '84 issue. He told us that the December '84 issue of Syntax should be out in another month or so.

Time Designs Magazine would like to welcome all our Canadian readers "on-board" who have recently subscribed. The number of our friends up north grows each day. It just goes to show you that Canadians know a good computer when they see one. Happy Sinclair computing to you all!

ZX81/TS 1000 KEYBOARD



A large number of ZX81/TS 1000 users have "discovered" perhaps the best keyboard add-on that has ever been offered for the price. It is the computer keyboard that was used with the Texas Instruments 994/a. They are being sold at surplus electronic outlets and some Radio Shack stores for the extremely low price of $2.95 to $5.95 (depending where you obtain one). The challenge is the installation. We have seen some nice ideas. Hopefully, we will be able to print them in an upcoming issue. If you have a suggestion, send it in and we may print yours.

SPECIAL REPORT:

2068 IS RETURNING TO U.S.

When Bob Dyl of the English Micro Connection contacted Timex of Portugal to see if he could obtain supplys of their new floppy disk system and 2068 "silver avenger" computer (as so nick-named by the British computer press), both of which had been sold in England for several months, he learned of some very suprising news. Antonio Gomez, the Managing Director of Timex Portugal told Bob that they were in the process of bringing the 2068 and the disk system to the United States themselves. In fact samples of each were currently in the hands of the FCC for approval. At this writing a Mr. Olivera who is the assistant to Gomez, is in Waterbury, Conn. at the Timex Corp. headquarters (which Timex Portugal is using for their temporary base) to finish up last minute paperwork, including signing the FCC certification release papers.

This certainly is a strange situation. A Timex paradox of sorts. Just a little over a year ago the Timex Corp. killed the 2068 in spite of strong support by both consumers and the computer press. And now, here is their Portugal counterpart bringing back almost the same computer to the American market. It isn't quite known exactly what Timex (U.S.) role in Portugal is and what are the controlling interests. It is known however, that both Portugal and the U.S. owned Sinclair technology rights, and when Timex U.S. dropped out, Portugal continued to use and produce that technology.

Antonio Gomez told Bob Dyl that if everything goes as planned, they should start shipping units by the end of May. As far as what marketing strategies are going to be used, and who will sell the computers and drives...the details are sketchy. Most of the Sinclair vendors that still exist here, have expressed interest.

The old Timex/Sinclair 2068 that we are familiar with has maintained its silver case and keyboard, but has been retitled simply the "Timex 2068". It's main circuit board has been a complete redesign, but has maintained the two ROM system, the sound chip, and the joystick ports. It now operates on nine volts instead of fifteen in the original model. In the cartridge port is a plug-in type Spectrum emulator board, and the rear connector has been reconfigured to be the same as that of a Spectrum. So basically, what you have is a Spectrum in 2068 clothes, with some of the subtle advantages of the 2068 remaining intact.

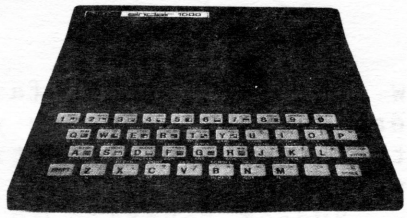
A nice addition to the Timex 2068 is it's accompanying disk drive system called the "Timex FDD." It is a four piece package with a power supply, interface, controller board, and a 3" Hitachi drive. The disk operating system is called (TOS). A CP/M board may be released a little later. Portugal is also planning to market the disk system for the U.S. T/S 2068 also, with a suitable interface for that computer.

Retail pricing for the 2068 and FDD has not been set as of yet, and Gomez told Bob Dyl that they were going increase the prices from which they first estimated.

Reaction has been mixed to this major announcement by Timex. Criticism and skepticsm has been voiced by those who still bear the scars from when Timex left the computer market a short while ago. Some disappointment has been expressed as to the incompatibility with existing hardware that has been developed over the past year for the old 2068. But the excitement is spreading for the most part, as Sinclair users in general here in the U.S. can expect to see much on it's way as far as support for the 2068/Spectrum is concerned. Quite a bit of software and hardware will no doubt be heading this way from major English companies.

Time Designs Magazine would like to express thanks and appreciation to Bob Dyl of the English Micro Connection, for releasing this information to the American Timex and Sinclair users.

INTRODUCTION TO COMPUTER CONTROL



by Bruce C. Taylor
Tucson, Arizona

OK all you T/S 2068 buffs, dust off that ZX81 or T/S 1000 (excuse me for a moment ZX81 and T/S 1000 users) and let's do some serious things with your computer. No, I'm not talking about doing your income taxes, balancing your checkbook or writing your first novel. When I say serious, I mean controlling something with your computer. Although you can use your T/S 2068...your ZX81 or T/S 1000 will do the job very nicely too.

Control what, with your computer? Control anything you think might be nice to control. Your lights, your garage door, your coffee pot or even your personal robot. PERSONAL ROBOT? Yes, your lowly T/S 1000 (excuse me again ZX81 and T/S 1000 users) is very capable of nearly anything you want to control with a computer. Remember those personal computer experts who brushed off the Sinclair and Timex computers as mere "toys" good only for learning about the basics of computing, but not for "serious" computing? Those "experts" now say you shouldn't tie up a personal computer with mundane home control tasks. Well, the experts can be correct half the time.

Even in the face of current 16 bit and soon to come 32 bit home computers, don't let anyone sell the 8 bit Z80 CPU computers short. The Z80 based computers are an excellent choice for control applications. If you don't believe me, look to Japan where an assult on the small computer market has been launched with their MSX (MICROSOFT EXTENDED) computers. One of the prime reasons they selected the Z80A CPU was because of it's potential for control applications.

In your ZX81 or T/S 1000 computers (include the T/S 1500, T/S 2068 and SPECTRUM too) you have the makings of a very capable computer control system. All you need to get started "interfacing with the world" is to add an input/output (I/O) board to your computer.

But wait a minute, before I launch into the details, you may have the following question. Why build a control project from scratch when I can buy a robot or home control/security system out of a box? First of all, it will probably be cheaper to build it yourself. Also, if you are inclined to tinker and build, you can continually expand and upgrade your system as you desire. This allows you to take advantage of new equipment/component advances, not to mention software upgrades.

For example, if you built a personal robot as I have done, you may have designed the controlling software to use the input avoidance technique of navigating around the house. With the addition of a range measuring device, like the Polaroid Ultrasonic Ranging Device, you can advance the navigation capabilities to a goal seeking ability. This can be done by modifying the software so that the robot seeks open areas to navigate through, much like you seek a doorway as opposed to avoiding walls in a room.

Back to the problem of building an I/O interface for your computer. Several options are available. One was described in a series of articles in RADIO-ELECTRONICS MAGAZINE last year. Another is an inexpensive I/O board offered by BUDGET ROBOTICS & COMPUTING of Tucson, Arizona. Both offer eight parallel lines of input and output, and use simple machine code subroutines to give a very fast I/O capability. How fast? The Budget Robotics board includes documentation for a simple optical encoder that can measure inputs up to several hundred pulses a second, and all for only a

few dollars. Is that fast enough and cheap enough to entice you to get on with this computer control area of interest?

Budget Robotics in fact offers an expanding line of peripherals including a buffered buss expansion board (currently for ZX81, T/S 1000 and T/S 1500) to allow you to add an almost limitless number of items in your computer control project. In fact, I have written a book describing these and other projects, to be published by early 1986 by TAB BOOKS. The centerpiece of the book is "H.E.N.R.Y." an internally computer controlled personal robot. He won a Golden Droid Award for Most Entertaining at the First International Personal Robot Congress & Exposition in Albuquerque, New Mexico last spring. What computer is inside H.E.N.R.Y.? You guessed it, a Sinclair ZX81. Hardware and software for all control projects is fully explained in the book. A home control interface is also described.

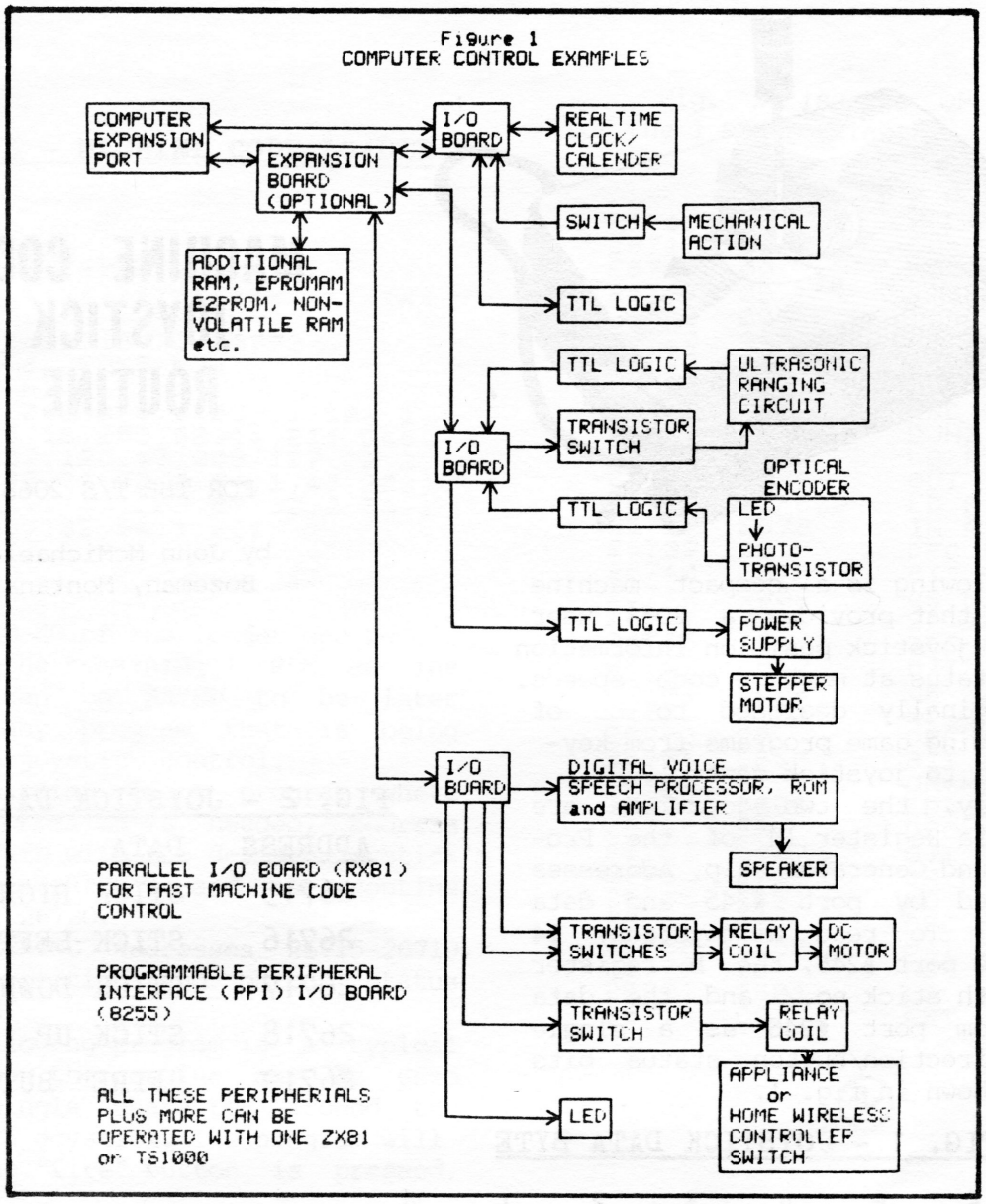
The expansion board used is the one originally built by COMPUTER CONTINUUM, but has been improved. This board can also be used to build a memory bank switching capability as described in Paul Hunter's series of articles in T-S HORIZONS Magazine. Using Paul's non-volitale memory board, control routines can be created and saved for instant loading into computer memory and easily changed as upgrades to your control project are needed. This method is cheaper and easier than burning Programmable Read Only Memory (PROM) chips, or trying to buy Electrically Eraseable PROM (E2PROM) chips.

Other expansion boards and I/O circuits can be used which will also do a good job. John Oliger described an expansion board in a Winter 1982 SYNTAX QUARTERLY article. An I/O circuit using the 8255 PPI (Programmable Peripherial Interface) integrated circuit chip is not as fast (no machine code) as the RX-81 I/O circuit, but works fine in many applications. Wiring of the 8255 circuit is included in Budget Robotics expansion board documentation and is described in my book.

To give you an idea of the range of control applications I am proposing, refer to Figure 1 as you read the rest of this article. Starting with the computer expansion port at the rear of your computer, you will want to add an expansion board if you expect to add more than two peripherials. Next you will need at least one input/output (I/O) board. The number and type of I/O boards will depend on what and how much you want to control. For example, you could easily add up to four RX-81 I/O boards and an 8255 PPI giving you up to either 56 input and 32 output lines or 32 input and 56 output lines. Each peripheral, as described in Figure 1, may require anywhere from one input line (optical encoder) to four input and seven output lines (realtime clock).

The following are examples using the RX-81 I/O bord: A realtime clock/calendar using seven output plus four input lines to read the time. A mechanical switch can be read by connecting an input line to ground. A transistor to transistor logic (TTL) state of low can be read directly by an input line. A logic high state can be read if inverted first, using a 74LS04 IC chip. The Polaroid (TM) Ultrasonic Ranging Circuit requires one output line to initiate a pulse transmit and one input line to read the return pulse. One input line is all that is required to read the status of a phototransistor in the optical encoder.

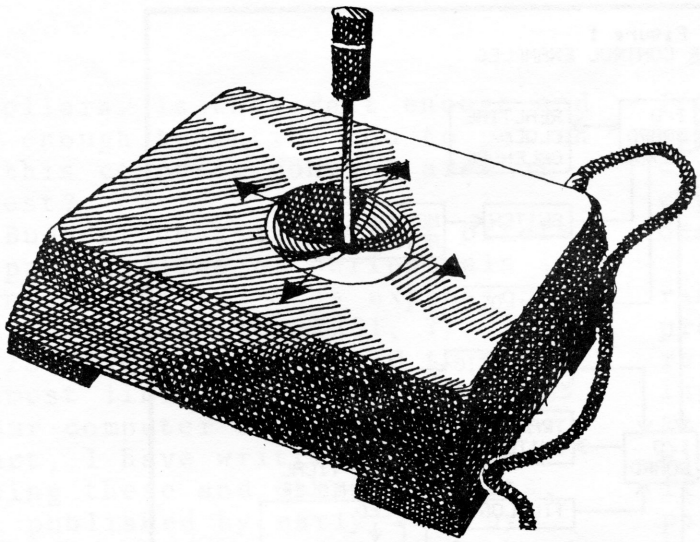
The following are examples using the 8255 PPI circuit: Two output lines are used to control a stepper motor driver with one line dsignating the direction of the motor rotation, and the other producing the step pulse. Ten output lines are used to control the



Digitalker (TM) Digital Voice Circuit with two ROM (Read Only Memory) word sets with eight lines used to select the word; one to select the ROM word set and one to activate the processor to produce the word.

The following are examples of control easily accomplished using either of the I/O circuits mentioned: Two output lines are required to control a direct current (DC) motor and select either direction where one output line is used for forward and one reverse. Each drives its own transistor switch which in turn activates a double pole, double throw (DPDT) relay coil. The coils are cross wired to the normally closed terminal of the opposite relay so that power to the motor cannot accidentally be applied in both polarities at the same time, causing a direct short circuit. For appliance or home wireless control switching, one output line is required for each on/off switch. Here each output line controls a transistor switch which in turn controls a relay. A light emitting diode (LED) can be activated in conjunction with any output line activity.

These examples are provided as food for thought. You can control virtually anything with your computer. Just use discretion. I would not recommend trying to control Aunt Mary's respirator. One last point, all the examples in Figure 1, plus more, can be controlled together by a single computer (ZX81, T/S 1000, ect.). Happy controlling.



MACHINE CODE JOYSTICK ROUTINE

FOR THE T/S 2068

by John McMichael
Bozeman, Montana

The following is a compact machine code routine that provides a 2068 user with digital joystick position information and button status at machine code speeds. It was originally designed to be of use in upgrading game programs from keyboard control to joystick control.

Basically, the two joysticks are controlled via Register 14 of the Programmable Sound Generator Chip. Addresses are transfered by port #245 and data by port #246. To read a joystick, 14 is written to port #245, the B register is loaded with stick no., and the data is read from port #246 as a single byte with direction/button status bits located as shown in fig. 1.

FIG. 1 - JOYSTICK DATA BYTE

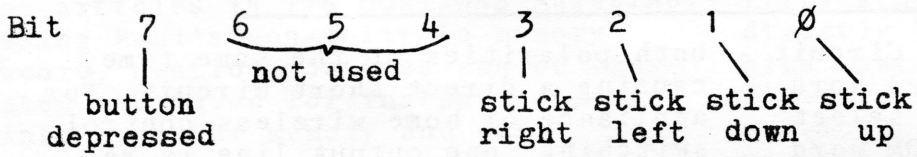


FIG. 2 - JOYSTICK DATA LOCATIONS

ADDRESS	DATA
26715	STICK RIGHT
26716	STICK LEFT
26717	STICK DOWN
26718	STICK UP
26719	"FIRE" BUTTON

The routine, as presented in this article, resides in a 1 REM statement, although it can easily be relocated.

Providing the second display file is not used, the first available address in a 1 REM statement is 26715. This and the next four addresses are where the results of reading a joystick will be stored (see fig. 2). After the routine is called, a 1 will be found in the addresses corresponding to positive switch closures and 0's in those addresses corresponding to negative or "open" switch conditions.

The program in fig. 3 is a machine code loader which puts the machine code into the 1 REM statement.

As the resulting 1 REM machine code lint is partially unlistable, any subsequent program lines will be unlistable unless...the [>] cursor is set to a line no. equal to or larger than the next line no. after the 1 REM and the following two direct commands are entered: POKE 23660, (your next program line above the 1 REM line): POKE 23661,0. This will cause the automatic listing to start at your first program line.

Enter and RUN the following machine code loader:

FIG. 3 - MACHINE CODE LOADER

```
   1 REM xxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxx
  10 FOR n=26715 TO 26773
  20 READ d: POKE n,d
  30 NEXT n
  40 DATA 0,0,0,0,0,33,91,104,1,
0,5,113,35,16,252,62,14,211,245,
1,246,2,237,120,43,203,127,32,2,
54,1,43,203,71,32,2,54,1,43,203,
79,32,2,54,1,43,203,87,32,2,54,1
,43,203,95,192,54,1,201
```

Lines 10-40 of the loader can be DELETED and the remaining 1 REM machine code line can be SAVED to be later MERGED with any program that is being up-graded to joystick control.

At the point in a program where joystick information is needed, address #26736 is POKED with the desired joystick's no. (1-LEFT; 2-RIGHT) and the routine is called at 26720.

By PEEKING addresses 26715-26719, the sticks' position and button status are obtained.

The following program is a typical example of how the routine may be used to move a single character around the screen with a joystick. The program will stop when the "fire" button is pressed.

FIG. 4 - EXAMPLE PROGRAM

```
   1 REM ?????![h???q# → the
remainder is unlistable

  10>LET x=26715: LET vert=10: L
ET horiz=15
  20 PRINT AT vert,horiz;" "
  30 RANDOMIZE USR 26720: REM **
the right stick is selected**
  40 LET verticle=vert+PEEK (x+2
)-PEEK (x+3)
  50 LET horizontal=horiz+PEEK x
-PEEK (x+1)
  60 IF verticle<0 OR verticle>2
1 THEN GO TO 30
  70 IF horizontal<0 OR horizont
al>31 THEN GO TO 30
  80 PRINT AT verticle,horizonta
l;"#"
  90 LET vert=verticle: LET hori
z=horizontal
 100 IF PEEK (x+4)=1 THEN STOP
 110 GO TO 20
```

Fig. 5 is the OP CODE listing for the 1 REM routine.

FIG. 5 - OP CODE LISTING

```
26715  00        NOP
26716  00        NOP
26717  00        NOP
26718  00        NOP
26719  00        NOP
26720  215B68    LD HL,26715
26723  010005    LD BC,1280
26726  71        LD (HL),C
26727  23        INC HL
26728  10FC      DJNZ 26726
26730  3E0E      LD A,14
26732  D3F5      OUT (245),A
26734  01F602    LD BC,758
26737  ED78      IN A,(C)
26739  2B        DEC HL
26740  CB7F      BIT 7,A
26742  2002      JR NZ,26746
26744  3601      LD (HL),1
26746  2B        DEC HL
26747  CB47      BIT 0,A
26749  2002      JR NZ,26753
26751  3601      LD (HL),1
26753  2B        DEC HL
26754  CB4F      BIT 1,A
26756  2002      JR NZ,26760
26758  3601      LD (HL),1
26760  2B        DEC HL
26761  CB57      BIT 2,A
26763  2002      JR NZ,26767
26765  3601      LD (HL),1
26767  2B        DEC HL
26768  CB5F      BIT 3,A
26770  C0        RET NZ
26771  3601      LD (HL),1
26773  C9        RET
```

2068 COLOR DEMO

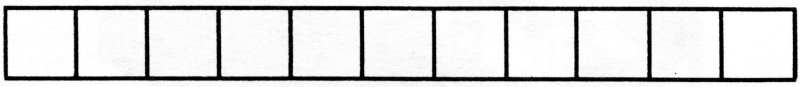
by Edwin S. Salter
Milton, Florida

```
  20 REM T/S 2068 COLOR DEMO
  30 REM  E SALTER  1-20-85
  50 RANDOMIZE 0
  55 BORDER INT (RND*7)
  60 FOR a=0 TO 150: INK INT (RN
D*7)
  70 CIRCLE 127,87,a-67: PLOT a,
a: DRAW 255-a-a,0: DRAW 0,175-a-
a: DRAW -255+a+a,0: DRAW 0,-175+
a+a
  80 NEXT a
  90 PAUSE 50: GO TO 55
 100 REM GOTO 9999 to list progr
am
9999 BORDER 7: PAPER 7: INK 0: C
LS : LIST
```

A GRAPHICS PROBLEM for the T/S2068

A "SERIOUS" GRAPHICS DISPLAY FOR THE 2068 AND 2040 PRINTER

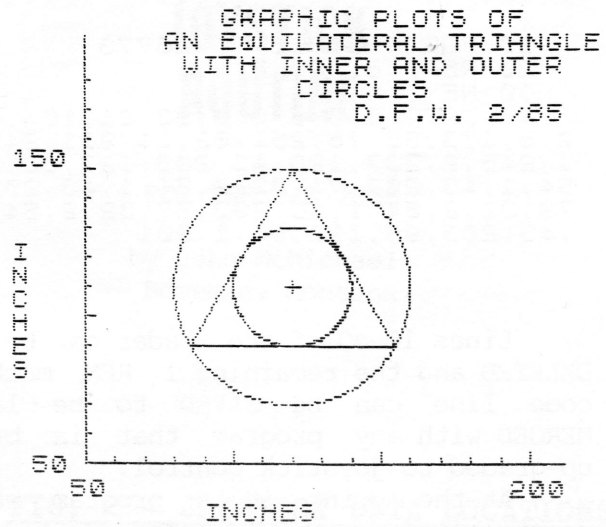
by Dick F. Wagner
Canby, Oregon



One of my pet beefs with many computer programmers is their lack of concern for identifying the basis for their programs. The display of the formulas/equations used, would help the user decide if the program is indeed the one needed for his (or her) calculations. It is often not easy to pick this information out of the program because of the way the programmer had to chop up the formula/equation. Also there should not be the need to spend a lot of time trying to identify the information needed.

The following program is substantiated as to formulas. This makes it easy to substitue as you wish. However the problem is complex in that several sytems are involved in developing a problem display. The formal graph with x and y axis, notations and scales provide an example for similar displays. The derivations for generating an equilateral triangle as well as drawing an inner and outer circle touching the triangle shows the steps. The chart coordinates have suitable divisions marked off, as well as enhancing every 5th division. The end product, instead of just displaying a triangle and 2 circles, shows the result of calculating a problem with interpretive results.

The first step is to draw the x and y axis, scales, divisions and headings. The radius of the outer circle is to be 40 inches. Use a scale of one pixel as one inch. Therefore, we need to provide for a figure 80 by 80. For a nice balance, place the circle center at 95 (x axis) and 80 (y axis). To allow space for x and y axis data place the x axis 20 and the y axis at 25. Position markers every 10 pixels (inches) and enhance every 5th mark. Remember that all positions are with respect to 0,0 for PLOT (bottom left corner) and 0,0 for PRINT (top left corner).



Lines 10-190 generate the axis, markers, axis numbers and axis names. Many lines include a printer correction factor of 1.24 (Timex 2040 Printer). This is necessary to produce a symetrical image. After all, who wants to excuse his (or her) equipment for making egg-shaped circles and non-equilateral triangles?

To review the derivation of the correction factor, just DRAW a square of good size, and make a printer copy. Measure the height and width (use a decimal or metric scale). The ratio of these dimensions is the correction factor. Now re-draw the square, using this multiplyer. For example, assume the square was drawn with PLOT 30,30:DRAW 80,0: DRAW 0,80: DRAW -80,0: DRAW 0,-80. For the 2040 Printer, you would change the 1st and 3rd DRAW to 1.24*80,0 and -80* 1.24,0. Check your printer to see if it is the same.

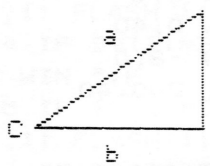
Lines 45-110 put in the markers on the x axis, and lines 120-190 put in the y axis markers. RUN the program from 10-190 and confirm proper display. CLS and the "graph paper" is now ready to plot the 3 figures. It is now time to calculate the dimensions for the figures and decide where to place them. Remember that we are going to have a display with measuring capability of the finished figures.

Calculations start with determining the sides of the equilateral triangle from one dimension, the radius of the outer circle. That has been given as 40 inches (3rd paragraph). Key in lines 395-470. DELETE later if desired. This part will draw a right triangle (any scale) and from the hypotenuse (the radius of the outer circle), we can determine ½ the base and the radius of the inner circle.

These formulas will be used:
b=a*SIN B/SIN A
c=a*SIN C/SIN A
circle=r*COS 2*PI,r*SIN 2*PI

a is radius (40), b is ½ the base of the equilateral triangle and c is the radius of the inner circle. All is shown on the sketch. We know that an equilateral triangle has all angles equal to 60 degrees. A line drawn vertically bisecting the base will also pass thru the circle center. RUN the program from 395, and display the triangle along with the calculations. Angle B may not be evident, so consider B as ½ of one third of 360 degrees.

```
TRIANGLE CALCULATIONS
  b=1/2 base, c=circle center
  to base, a=circle radius
  (given as 40).
```




```
a=40 (radius)
B=1/2*120=60 deg.
A=90 deg.
C=(180-90-60)=
   30 degrees
b=40*SIN 60/
   SIN 90=34.64
c=40*SIN 30/
   SIN 90=20
```

There are all the dimensions required.

Lines 200-320 draw the 3 figures with center at 95,80.

Lines 330-370 put in a title, initials (yours) and date.

I think you will agree that our computers can produce a product that takes it out of just a visual display.

```
   5 REM Lines constructed at
 right angle and at the midpoint
 of each side of an equilateral
 triangle will intersect. This
 point will be the center of a
 cirtle that will touch each side
 and also a circle will touch
 each corner of the triangle.
   10 PLOT 25*1.24,20: DRAW 0,145
 : PLOT 25*1.24,20: DRAW 200,0
   20 PRINT AT 21,10;"INCHES"
   30 PRINT AT 10,0;"I";AT 11,0;"
N";AT 12,0;"C";AT 13,0;"H";AT 14
,0;"E";AT 15,0;"S"
   35 PRINT AT 20,3;"50";AT 20,26
;"200"
   40 PRINT AT 19,1;"50";AT 6,0;"
150"
   45 FOR N=25*1.24 TO 220 STEP 1
0*1.24
   50 FOR A=20 TO 22
   60 PLOT N,A
   70 NEXT A: NEXT N
   80 FOR N=25*1.24 TO 220 STEP 5
0*1.24
   90 FOR A=22 TO 24
  100 PLOT N,A
  110 NEXT A: NEXT N
  120 FOR M=20 TO 150 STEP 10
  130 FOR B=25*1.24 TO 27*1.24
  140 PLOT B,M
  150 NEXT B: NEXT M
  160 FOR M=20 TO 150 STEP 50
  170 FOR B=27*1.24 TO 29*1.24
  180 PLOT B,M
  190 NEXT B: NEXT M
  200 PLOT 95*1.24,60
  210 DRAW 69.28*.5*1.24,0
  220 DRAW -34.64*1.24,60
  230 DRAW -34.64*1.24,-60
  240 DRAW 34.64*1.24,0
  260 REM circle center is 95,80
  270 PLOT 95*1.24,80-2: DRAW 0,4
: PLOT (95-2)*1.24,80: DRAW 6,0
  290 FOR A=0 TO 2*PI STEP PI/120
  300 PLOT 95*1.24+40*1.24*COS A,
80+40*SIN A
  310 PLOT 95*1.24+20*1.24*COS A,
80+20*SIN A
  320 NEXT A
  330 PRINT AT 0,11;"GRAPHIC PLOT
S OF"
  340 PRINT AT 1,8;"AN EQUILATERA
L TRIANGLE"
  350 PRINT AT 2,9;"WITH INNER AN
D OUTTER"
  360 PRINT AT 3,15;"CIRCLES"
  370 PRINT AT 4,18;"D.F.W. 2/85"
  375 COPY
  380 PAUSE 4e4
  390 CLS
  395 PRINT "TRIANGLE CALCULATION
S": PRINT "  b=1/2 base, c=circl
e center      to base, a=circle r
adius         (given as 40)."
  400 PLOT 20,20: DRAW 70,0: DRAW
 0,40: DRAW -70,-40
  410 PRINT AT 19,1;"C";AT 19,12;
"A";AT 13,12;"B"
  420 PRINT AT 20,6;"b";AT 16,12;
"c";AT 15,6;"a"
  430 PRINT AT 13,15;"a=40 (radiu
s)";AT 14,15;"B=1/2*120=60 deg."
;AT 15,15;"A=90 deg.";AT 16,15;"
C=(180-90-60)=";AT 17,16;"  30 d
egrees"
  440 PRINT AT 18,15;"b=40*SIN 60
/"
  450 PRINT AT 19,15;"   SIN 90=3
4.64"
  460 PRINT AT 20,15;"c=40*SIN 30
/"
  470 PRINT AT 21,15;"   SIN 90=2
0"
  480 COPY
```

2068 PROGRAM

SLOT MACHINE

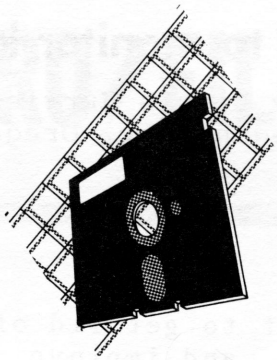
by Bill Gunter
Sacramento, California

REAL LAS VEGAS STYLE CASINO ENTERTAINMENT! The program is a slot machine which plays 25 cent pieces, and keeps track of your winnings and losses (it even plays a little fanfare if you hit the jackpot). The odds ought to be pretty close to Nevada odds, and should keep the children quiet for hours. It is important to get the spacing just right in line 15, since the "fruit" which appear in the slot machine windows are "slices" of the character string "A$". (EDITOR'S NOTE: this listing was made with a printer that doesn't use "0" for zero. So be careful when entering numbers in this program.)

```
 1 REM  **********************
 2 REM  *BILLY'S SLOT MACHINE*
 3 REM  **********************
 5 INK 1
 6 LET P=0
 7 PAPER 6
 8 BORDER 6
 9 CLS
10 LET S=500
11 GO SUB 1000
13 PRINT  AT 1,28;S
14 PAUSE 150
15 LET A$="CHERRYLEMON  PLUM ORANGE BELL  -BAR-CHERRY"
16 PAPER 6
18 GO TO 81
20 FOR J=1 TO 22
21 PRINT  AT 7,20;"    "
25 PRINT  AT 10,J;" "
30 PRINT  AT 11,J;" "
35 PRINT  AT 12,J;" "
39 PRINT  AT 20,1;"3 BAR OR BELL=JACKPOT"
40 NEXT J
55 DIM B$(3,6)
60 FOR J=1 TO 3
65 LET B$(J)=A$(1+6* INT ( RND *7) TO 42)
67 IF B$(J)="CHERRY"  THEN  PAPER 2
68 IF B$(J)="LEMON " THEN  PAPER 6
69 IF B$(J)=" PLUM " THEN  PAPER 3
70 IF B$(J)="ORANGE" THEN  PAPER 2: INK 6
71 IF B$(J)=" BELL " THEN  PAPER 0: INK 6
72 IF B$(J)=" -BAR-" THEN  PAPER 7: INK 0
73 PRINT  AT 11,7*J-5;B$(J)
74 BEEP .05,15
75  PAPER 6: INK 1
76 NEXT J
78 PLOT 214,49
79 DRAW 0,55: DRAW 2,0: DRAW 0,23: DRAW -8,0: DRAW 0,-23: DRAW 2,0: DRAW 0,-55
80 GO SUB 2000
81 PRINT  AT 7,2;"DEPOSIT 2 BITS-->"
82 PRINT  AT 7,21; FLASH 1;"D"
83 IF  INKEY$ ="d" OR  INKEY$ ="D" THEN  PRINT  AT 7,2;"                    ": PR
INT  AT 7,20;"25c": GO TO 85
84 GO TO 83
85 PRINT  AT 6,28;"PULL": PRINT  AT 7,27;"<----"
86 PRINT  AT 7,26; FLASH 1;"P"
87 LET S=S-25: PRINT  AT 1,28;S
89 IF  INKEY$ ="p" OR  INKEY$ ="P" THEN  GO TO 91
90 GO TO 89
91 PRINT  AT 5,26;" "; AT 6,26;"      "; AT 7,26;"      "; AT 8,26;"  "; AT 9,
26;" "; AT 10,26;" "; AT 11,26;" "; AT 12,26;" "; AT 13,26;" "; AT 14,26;" "
95 GO TO 20
1000 PRINT
1001 PLOT 0,4
1002 DRAW 192,0
1003 DRAW 0,148
1004 DRAW -192,0
1005 DRAW 0,-148
1006 PLOT 192,24
1007 DRAW 8,0
1008 DRAW 0,40
1009 DRAW -8,0
1010 PLOT 200,40
```

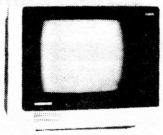
```
1011 DRAW 12,0
1012 PLOT 200,48
1013 DRAW 12,0
1014 CIRCLE 212,44,5
1015 PLOT 210,49
1016 DRAW 0,55
1017 PLOT 214,49
1018 DRAW 0,55
1019 DRAW 2,0
1020 DRAW 0,23
1021 DRAW -8,0
1022 DRAW 0,-23
1023 CIRCLE 172,116,14
1024 PLOT 6,70
1025 DRAW 180,0
1026 DRAW 0,28
1027 DRAW -180,0
1028 DRAW 0,-28
1029 PRINT  AT 4,5;"BILLYS SLOT"
1030 PRINT  AT 5,7;"MACHINE"
1033 PRINT  AT 14,4;"2 CHERRY PAYS 2"
1034 PRINT  AT 15,4;"3 CHERRY PAYS 5"
1035 PRINT  AT 16,4;"2 PLUM   PAYS 5"
1036 PRINT  AT 17,4;"3 PLUM   PAYS 10"
1037 PRINT  AT 18,4;"2 ORANGE PAYS 5"
1038 PRINT  AT 19,4;"3 ORANGE PAYS 10"
1039 PRINT  AT 1,15;"YOU NOW HAVE"
1040 RETURN
2010 IF B$(1)=B$(2) AND B$(1)="CHERRY" THEN  LET P=50: PRINT  AT 1,1; FLASH 1;"Y
OU WIN ";P
2011 IF B$(1)=B$(2) AND B$(1)=B$(3) AND B$(1)="CHERRY" THEN  LET P=125: PRINT  A
T 1,1; FLASH 1;"YOU WIN ";P
2012 IF B$(1)=B$(2) AND B$(1)=" PLUM " THEN  LET P=125: PRINT  AT 1,1; FLASH 1;"
YOU WIN ";P
2013 IF B$(1)=B$(2) AND B$(1)=B$(3) AND B$(1)=" PLUM " THEN  LET P=250: PRINT  A
T 1,1; FLASH 1;"YOU WIN ";P
2014 IF B$(1)=B$(2) AND B$(1)="ORANGE" THEN  LET P=125: PRINT  AT 1,1; FLASH 1;"
YOU WIN ";P
2015 IF B$(1)=B$(2) AND B$(1)=B$(3) AND B$(1)="ORANGE" THEN  LET P=250: PRINT  A
T 1,1; FLASH 1;"YOU WIN ";P
2016 IF B$(1)=B$(2) AND B$(1)="LEMON " THEN  PRINT  AT 1,1; FLASH 1;"SORRY, NO W
IN": PAUSE 100
2017 IF B$(1)=B$(2) AND B$(1)=B$(3) AND B$(1)=" -BAR-" THEN  PRINT  AT 1,1; FLAS
H 1;"JACKPOT - $10": LET P=1000: GO SUB 4000
2018 IF B$(1)=B$(2) AND B$(1)=B$(3) AND B$(1)=" BELL " THEN  PRINT  AT 1,1; FLAS
H 1;"JACKPOT - $10": LET P=1000: GO SUB 4000
2019 LET S=S+P
2020 PRINT  AT 1,28;"    "
2021 PRINT  AT 1,28;S
2022 LET P=0
2025 IF S=0 THEN  GO TO 3000
2040 PAUSE 75
2050 PRINT  AT 1,1;"                "
2060 RETURN
3000 PRINT  AT 1,0;"YOU ARE BUSTED-FOR REPLAY HIT "; FLASH 1;"R"
3010 IF  INKEY$ ="R" THEN  RUN
3020 GO TO 3010
4000 BEEP .2,-3: BEEP .2,2: BEEP .2,6: BEEP .4,9: BEEP .2,6: BEEP .8,9
4010 RETURN
```


COMING NEXT ISSUE...



THE
FLOPPY
DISK
INVASION

our spectacular summer issue!



VAMP

tv to monitor kit

by Dennis Jurries
Oregon City, Oregon

If you want to get rid of un-wanted lines, and improve your TV picture without paying over $200, then this conversion kit is for you.

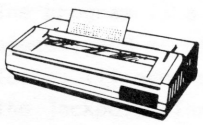
I sent $39 to VAMP Inc., and 10 days later I received a package containing a circuit board, a package containing resistors, capacitors, and a few other parts, along with an eight page instruction manual with schematics. After a couple hours of assembling the PC board and mounting a TV/monitor switch, and the PC board...I was ready to make the circuit/TV connections.

Next, I went out and paid $8.50 for a Sams Photofact, for my model of TV (Sanyo). The instruction manual tells where, and shows typical examples of where to make the connections. I would still recommend that you either have experience with TV's or know someone who has, and will help you with this part of the project. I made three wrong connections before getting it right.

The final result is a color monitor/TV with a picture every bit as good as that of a dedicated new monitor, for a total of approximately $48 and a few hours labor.

You can obtain the TV To Monitor Conversion Kit from: VAMP Inc., PO Box 411, Los Angeles, CA, 90028.

TASWORD TWO TIPS



by William D. Erickson
and
Paul T. Erickson
Decatur, Georgia

1.

Many of us that use TASWORD TWO are bothered by one thing that spoils all the fun. This is the fact that once you have printed something on your 80 col. printer, you can not again print with your T/S 2040 Printer without going through a big hassel. Also, many of the command functions of the program also produce the same result and leave the user who only has the T/S 2040 Printer between a rock and a hard place.

To correct this problem, go to the main menu by using SYMBOL-SHIFT A, exit to BASIC by pressing b, then add this line to the BASIC portion of the program:

```
29 POKE 26703,0 : POKE 26704,5
```

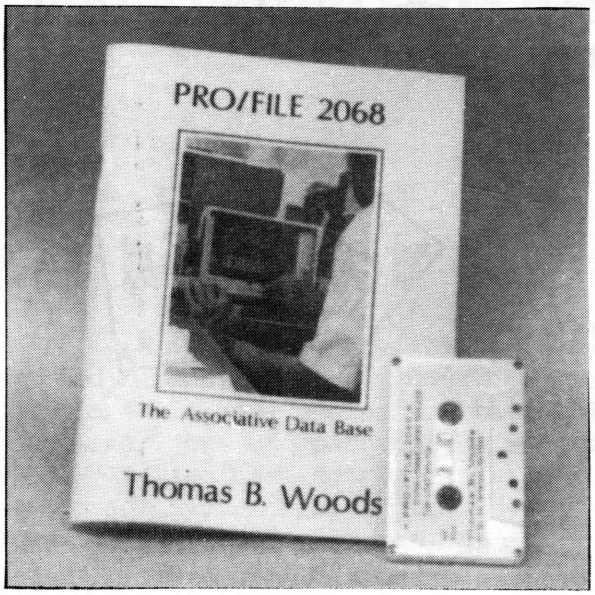
Now GOTO 25, and save this version of the program by pressing "t".

Now any time your T/S 2040 fails to print, all you have to do is use: SYMBOL-SHIFT A, then press "y" to return to your text and print to your hearts content. This in no way interferes with your 80 col. printer.

2.

LARGE PRINT
USING TASWORD TWO
and a
T/S 2040 PRINTER

Set right margin to 32 columns. Set window to a 32 col. screen. Stay in this mode when you print your text. All other aspects remain the same. Large print still works, just more so.



PRO/FILE 2068

reviewed by Tim Woods
Colton, Oregon

PRO/FILE 2068 is a very special program, that the author Thomas B. Woods (no relation) has painstakingly put together for owners of the T/S 2068. Supplied with the software on cassette is a real gem of a users manual. It is 143 pages long and makes for some interesting reading.

What does PRO/FILE 2068 do? Tom goes into great detail in the manual describing what it is all about. Basically, it is a filing program or "data base". The possible applications are almost endless. These examples are given: filing mailing lists, business transactions, inventories, ham radio logs, and all kinds of records.

Right away, you will probably notice, that this data base is a little different than some others that were previously available. One that I think everyone has used at one time or other, is Timex's VU-FILE. The way VU-FILE works is by setting up "data fields" that the user specifys when setting up his file. Once the data fields are set, it is a real pain to go back and change or correct the files parameters, without totally redoing the whole thing. PRO/FILE doesn't use "data fields", but instead stores each individual file or record in individual screen displays. To change or delete is very easy with screen displays.

I gave PRO/FILE 2068 a little test drive, I entered 20 of my all time favorite songs as individual files each. Included in the file was the songs title, author, the year it came out, and a few lines from each one. I found that entering the data was easy, but I constantly had to refer to the manual to make sure everything was right. I am sure an avid PRO/FILE user would remember all of the commands...but as a beginner, I stumbled a bit. When all the data had been entered, I began to experiment with some of the multi-word search functions. When I asked for a particular song, it immediately flashed up on the screen.

PRO/FILE has a total capacity of 28,000 bytes! It is compatible with the Timex 2040 Printer or any number of Centronic interfaces and printers.

If you have a special application for PRO/FILE, I am sure information on it would be found in the users manual. It goes into great detail. There is even the program listing of the actual program, that can be altered to suit particualar tastes.

PRO/FILE 2068 is an exceptional value at $29.95. Its file searching and retrieving capabilities are very superior to other data bases that I have seen.

Available from several Timex vendors, and the author, Thomas B. Woods, PO Box 64, Jefferson, NH 03583.

COUPON MAGIC

2 PROGRAMS

reviewed by Tom Judd
Mulino, Oregon

BILL'S COUPON MAGIC is a program written by Bill Erickson of Decatur, GA for the T/S 2068. He sells his own program through HD SOFTWARE, for $14.95 + $1.50 for postage. His address is: 1445 Oldfield Road, Decatur, GA 30030.

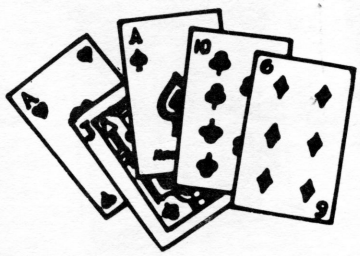
This program is a lot more than it first appeared. Actually, there are three differenct functions. The first one is a shopping list that you can enter your items in categories and include the estimated cost of each item. When you are finished, it will give you the estimated amount of money you need to take with you to the store. There is an example provided for easy reference. The second feature is the coupon manager. It is very comprehensive and allows you to store up to 99 coupons with a description apiece. Then you can add coupons to the file or delete old expired ones with the search option Finally, the third function is an all purpose list manager for anything that suits your fancy.

All of the lists can be sent to the 2040 Printer. You can also save all your data on tape. The program comes with very good documentation.

COUPON MAGIC is an attempt at a useful program. At first, I had visions of sitting down and clipping coupons and tediously entering each one into the computer. This seems like it would be a time consuming chore. I feel this program has a lot more potential being a list manager.

Mr. Erickson has programmed some very nice screen displays for this program, and I really liked the "women with shopping carts" design. All in all this is a nice software package.

THE DEALER'S DEN



THE DEALER'S DEN is a card game program written by Timothy Kessler for the T/S 2068. It is sold exclusively by WMJ DATA SYSTEMS, 4 Butterfly Drive, Hauppauge, New York 11788. It sells for $19.95 ppd. and there is also a version available for the Commodore 64.

On side one of the cassette tape, is the main program THE DEALER'S DEN. You play four hands of Poker against the dealers one hand. You can throw away unwanted cards once for each hand. You can also select a bet. At the beginning of the program is a table that shows what combination of cards get what value.

I am not exaggerating when I say that THE DEALER'S DEN is genuine fun. Although, I must admit that I am a card game fanatic. When I started playing this one, they couldn't tear me away from the screen!

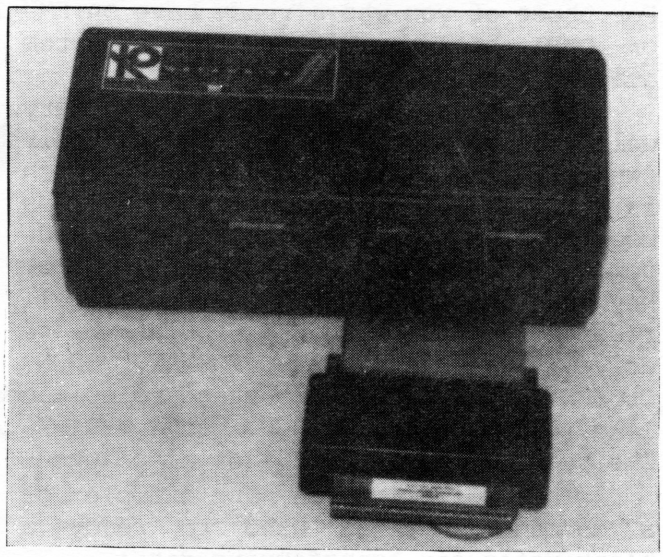
On side two is another game called DRAW POKER. It is just like the first game, only this time you play only one hand against the dealers hand. It is easier to play, but much harder to win. I preferred the first game.

The graphics for these programs are very good. About the best I have seen for card games on the Sinclair. There is even a little animated card-shuffling sequence while the program is loading. I would recommend that you do use a quality monitor, due to the high resolution of some of the cards and suits are hard to tell apart sometimes.

If you want to pass some time away playing a challenging game of Poker, do yourself a favour and pick up a copy of THE DEALER'S DEN.

THE DAMCO/ROTRONICS WAFADRIVE REVIEWED

by Tim Woods
Colton, Oregon



If you have a very limited work area dedicated to your 2068 computer, or have a small home business, the following product may be of particular interest to you. It is the Rotronics Wafadrive mass-storage system from England. I purchased our unit from Damco Enterprises (67 Bradley Ct., Fall River, MA, 02720), who is the exclusive distributor of the Wafadrive here in the U.S. Damco has put together a special package that allows the Rotronics Wafadrive to operate on the T/S 2068, since the system was originally designed for the Sinclair ZX Spectrum. This package includes all of the "goodies" that come with the stock Wafadrive (which we will discuss shortly) plus a cartridge-style Spectrum emulator, and an adapter for the 2068's expansion port. The Spectrum and the Timex have different rear-edge ports.

When the Rotronics Wafadrive arrived in the mail, I was first struck by the size of the box it came in. Very small, to say the least. And the unit itself is quite compact. It reminds me of a Tupperware container with a lid (only black). The old saying, "good things come in little packages," seems to fit here. The Rotronics has not just one drive, but two. They are the "stringy floppy" type, which use special micro-cartridges (or wafers) designed by Entrepo. The Wafadrives are custom manufactured by BSR (the audio company) for Rotronics. Just for your information, A & J Microdrive uses the exact same wafers in their system for the 2068, but the similarity stops there.

Along with the dual drives, there is also a built in Centronics parallel printer interface and a R232 serial interface. The ports for these interfaces are at the rear of the unit along with a normal Spectrum expansion port, to which a Timex 2040 or ZX Printer can be attached. On the front of the Rotronics are the two Wafadrive slots (drives A and B respectively), along with three LED's: one for power on, and the other two designating which drive is active. Protruding from the case, just below the drives, is a very short (about four inches) cable with the special adapter already connected to the end. This is what plugs into the rear of the 2068. Placement of the Rotronics Wafadrive is limited to directly behind the computer. For my installation,it posed a slight problem, but shortly corrected by moving the monitor off to one side.

Also in the same little box came two wafers. One is blank, and the other is a free word processor program from Softek, which is cusomized to work with the Rotronics. It is supplied with a 40 page manual, and is fairly comprehensive (ie. 64 col., auto word warap/justification, page numbering, screen editor, block operations, ect.). This is a nice touch, to include a program that can be used right away with the system.

A 68 page manual is provided for the Wafadrive. The manual is spiral bound, and is clearly written and suprisingly detailed...giving some examples as it covers each concept.

You may be wondering what a system like this costs. Especially with all of the extras that are included. It is only $229.95 from Damco, plus $5.00 for postage. I also ordered the optional Centronics cable for $12.95. If you are the owner of a Spectrum, there is a version of the Wafadrive for $169.95. For those of you who already have an EMU-1 or OMNI emulator, there is a sytem available for $199.95.

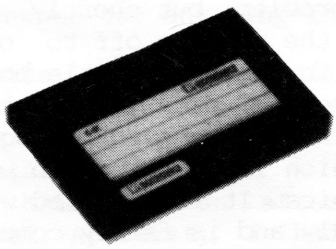
How does it all stack up? Very well indeed. The Wafadrives have their own operating system (WOS) in ROM, which is similar to disk operating systems used by other computers. Extended BASIC commands are used and typed in from keywords on the 2068 that were originally reserved for use with the Sinclair Microdrives. These are CAT, FORMAT, OPEN, CLOSED, ect., along with standard commands like LOAD, SAVE, MERGE, and VERIFY. The symbols "#" and "*" are also used.

The following is an example of a command that is used to ready a blank wafer for transferring data:

FORMAT*"a:wafername"

"a" is used to denote which drive is being activated.

Loading time was fast. Transfer baud rate is rated at 18k. I timed the supplied word processor program, and it loaded in 30 seconds. A comparable cassette program would take three minutes or longer.



Wafers are available in three sizes (or storage capacities): 16k, 64k, 128k. They appear to be rugged for their tiny size, and have a plastic sliding dust cover. A wafer has a continuous loop of magnetic tape inside, and operates on a principle much like the old eight-track audio tapes. The shorter tapes will load files much faster than say the 128k length.

Using the Centronics interface was a snap. I hooked it up to my TEAL model 270 electronic typewriter/daisy wheel printer via the optional cable. The interface will send standard ASCII codes to the printer using LPRINT, LLIST, some BASIC lines using "stream" channels, or block commands in the supplied word processor software. Since this is a "no-frill" type interface, it doesn't include smart software (like the Aerco interface), that allows you to execute graphics screen dumps, ect. with dot matrix printers. These functions would have to be developed by further programming and software.

I didn't give the RS232 interface a try, since I don't have a compatible peripheral. It should be pointed out that it is a bidirectional type, and baud rate is selectable.

Most prospective buyers would probably be concerned about cassette software compatibility. First of all, take into consideration that this is a Spectrum system. Secondly, commercial programs are usually protected against making back-up copies of any kind (cassette or wafer). You do have the following options:

1. Make wafer copies of Spectrum programs that have the option for making back-ups.

2. Use a "header-reader" type program to help you BREAK and SAVE commercial cassette software for the Spectrum.

3. Any Spectrum program that you can BREAK and SAVE, may be transferred to wafer.

4. Some software for the Timex can be saved on wafer. This includes a few machine code programs, and most all of the BASIC programs. For eample, I made a wafer copy of programs from the "Great Game And Graphics Show" by JRC Software.

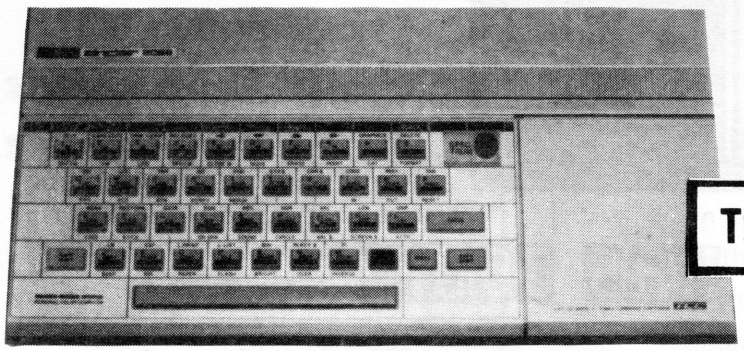
You may also make copies from wafer to wafer, simply by using the MOVE command. Commercial software is being developed and sold on Rotronics type wafers now. Damco has a list and prices of several titles that they carry in stock.

Much could be said about the Rotronics Wafadrive. More info than we obviously have space in the magazine for. So, I will close, leaving you with a few thoughts to consider. First, the Rotronics is a little faster and lower in price than the A & J model 2000 (if you

were to add an additional drive, printer interface, ect.). The Rotronics is about half the price of a good disk system with only a single drive, but not nearly as fast as floppy disks. It is about the same price as a complete Sinclair Microdrive system, but the Rotronics comes with more features like the built in Centronics interface and free word processor. Also take into consideration that you also receive Spectrum emulation and a Spectrum expansion port...this will open a whole new world of information for the T/S 2068.

Over all, the features that I liked best were the units small (all-in-one) size, and the ease in which the Rotronics filed and retrieved data. The price should also be within reach of most Timex users budgets.

Good work Rotronics and Damco.



TS 2068 / SPECTRUM-WARES

Good news for T/S users who have installed the ROMSWITCH or a Spectrum ROM in their computers. They can now use the Sinclair ZX Microdrives...without the added cost of purchasing an emulator. The method is a brand new Microdrive Adapter available from English Micro Connection (15 Kilburn Ct., Newport, RI 02840), for only $35 ppd. The Adapter is a standard "twister" type Spectrum expansion port board, with the addition of a special circuit that includes a 74LS10 IC, a diode, and a resistor. The circuit was designed by John Oliger, and was incorporated on the board by Doug Dewey, who is the manufacturer of the Microdrive Adapter. Now the ROMSWITCH, Spectrum ROM's and OMNI emulators can operate the Interface One, Microdrives, and other English peripherals on their 2068, without a hitch! The English Micro Connection also carries a selection of Sinclair merchandise including the Microdrives and the Spectrum Plus computer. Write for details.

The Software Supermarket in London, England has just recently changed their name to SPEEDYSOFT. They do a large overseas mail order business, and accept American credit card numbers. Their newest software catalog features 24 Spectrum programs newly released. For details, write to: Speedysoft, 87 Howard's Lane, London SW15 6NU England.

Time Designs Magazine will be reviewing some more Spectrum programs in our next issue. Since there is such a wide variety of titles available from England, reading a report from a trusted reviewer before purchasing, makes good sense. After all, money doesn't grow on trees. As of this writing the American dollar compared to the British pound was $1.22 (a slight increase).

TS 2068 DISC SYSTEM

FD-68 INTERFACE

Controls 1-4 drives

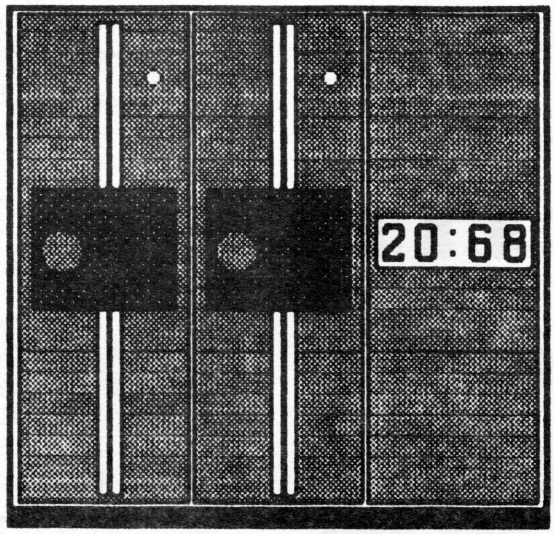
3-8 inch Shugart Comp.

Single or double sided

40/80 tracks per side

64K RAM & 8K ROM on board

RGB monitor output



SYSTEM COMPONENTS

$199 FD-68 Interface

$99 Drive 40T/DS/DD
5 inch/400 kilobyte

$99 Dual Drive Cabinet and 5 amp Pwr Pack

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C ITOH 8510 Printer	375	375
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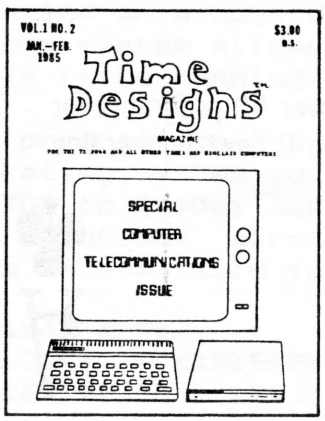

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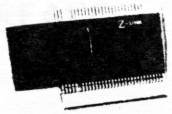

Z-LINK simply plugs in the back of your T/S 2068. When used with a Spectrum emulator (EMU-1 or OMNI) it allows you to run the Sinclair Microdrives, light pens, voice boxes...any ZX Spectrum peripheral! See review in March/April '85 issue of Time Designs Magazine.

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Z-LINK kit with all parts $37 ppd.
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COUPON MAGIC

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T/S 2068

A coupon file that holds 100 coupon descriptions with up to 99 coupons in each. A shopping list section that is worth the price all by its self. And a storage list that holds 100 items and their locations.

While the other two files are great, the shopping list is the one that gets most of the work done. Like the other two, it has on screen edit, but it also will check up on the other files. It will tell you approx. how much money to take when you go to the store, then print out a shopping list on your 2040 that can hold up to 100 items with notation to tell you if you have a coupon for an item. It also makes a notation if you have the item stored someplace, + it gives you a place by each item to check off as you put it in the cart.

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*** AS DESCRIBED IN T S HORIZONS (March 1984 through March 1985) ***

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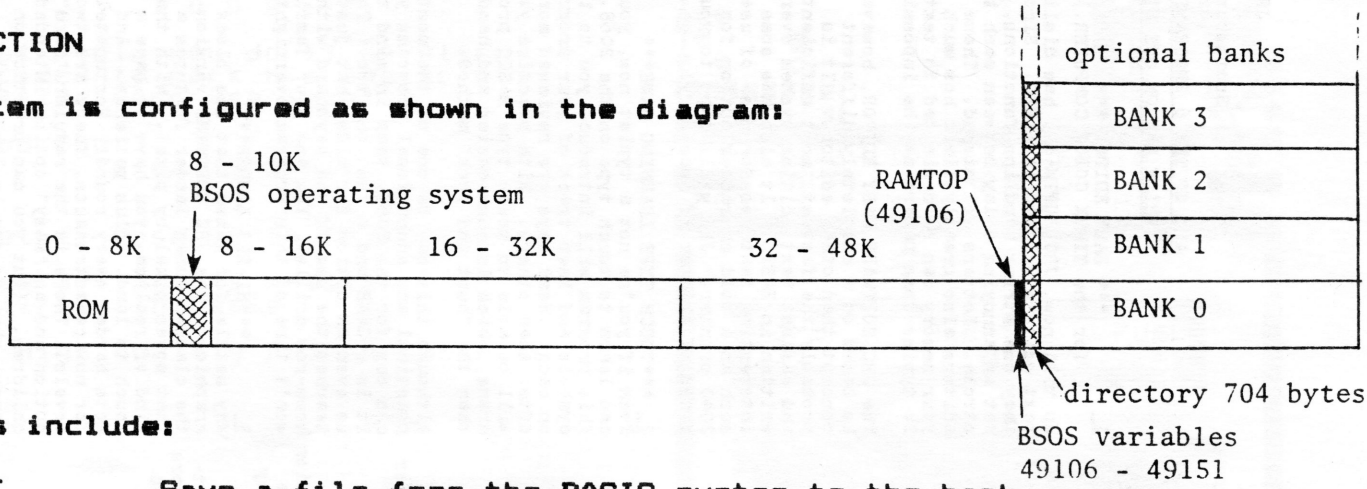
*** OR BUILD A BANK-SWITCHED SYSTEM WITH LIMITLESS MEMORY ***

INTRODUCTION

The system is configured as shown in the diagram:



Commands include:

SAVE	Save a file from the BASIC system to the bank
LOAD	Load a file back from the bank into the BASIC system
PURGE	Purge a file from the bank
RECLAIM	Clear variables or a program (or part) from the BASIC system
PACK	Repack the contents of the bank
BANK	Change from one bank to another
ROOM	Determine space available in a bank
QUIT	Return to Sinclair BASIC system

A sample directory listing the contents of a bank is shown on the right. Some of the routines in BSOS can be called from within a BASIC program to create a virtual memory system -- so you can have a program larger than 16K or a huge data file. A virtual memory system allows the program to change while it is running.

The program on the tape will transfer the operating system to the 8-10K block; reset RAMTOP to 49106; and load a directory (and any routines already in the bank). The tape is available for $10 ppd from:

HUNTER
1630 FOREST HILLS DRIVE
OKEMOS, MICHIGAN 48864

```
BANK 1 DIRECTORY
================================
NO.   NAME     .EXT  ADDR  SIZE
---   ----     ----  ----  ----
A: DIRECTORY  .DIR:49152:00704:
B: SAVEROUTINE.PRG:49856:00134:
C: DEC-TO-HEX .PRG:49990:00308:
D: HEX-TO-DEC .PRG:50298:00134:
E: CONVERSION .PRG:50432:00750:
F:
G:
H:
I:
J:
K:
L:
M:
N:
O:
================================
1:SAVE  3:PURGE   5:PACK  7:ROOM
2:LOAD  4:RECLAIM 6:BANK  8:QUIT
```

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Make a quantum leap in your processing power with JRC BASIC COMPILER.

The Z80 ASSEMBLER uses a full two passes, so the conveniencesyou normally associate with a good assembler are all here. There is full use of LABELS so you never have to worry about jump addresses or where a piece of data might be. The assembler can also handle simple expression evaluation which takes work off the programmer. Although there are many assemblers available for the 2068, very few are as easy to use as the JRC Z80 ASSEMBLER. Entering and editing you mnemonics are easy since there are multiple statements per line and comments can be put anywhere.

****
**********JRC TIPS**********
****

TAPE UNLOCKER for the 2068: MERGE "". This easily stops automatic run. If you find yourself in an input that you can't get out of then type: USR 15002

Have you noticed that while in the command mode you can type commands after "LOAD"? That way you can have the computer BEEP, SAVE OR LOAD SOMETHING ELSE after the first load.

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1 *** EASY EDITOR ***
(.for the TIMEX COLOR COMPUTER.)

Up till now, JRC SOFTWARE, has disliked text editors written in BASIC. Since they use string handling functions, you get an annoying delay between each keystroke. Letters get missed. These editors also greatly limit how much of your memory can be dedicated to text. So typing long papers may be impossible.

The JRC SOFTWARE EASY EDITOR, however, is based on a completely different concept than other editors. It is probably the fastest, most efficient, and easiest text editing system ever written in BASIC. It also has some interesting features for ease of use, such as a bold character option for the 2040 printer. JRC will adapt to your brand of printer if necessary!

2 ***TOUCH TYPE LEARNING GAME***

Even if you're not a typist now, you can learn to touch type on the 2068. This program will introduce you to 197 symbols and keep track of your progress on each. Weak keys are reviewed more often than others. With practice you will be able to touch type BASIC programs, which is much easier and handier than the "hunt and peck" method.

Although this may be one of the most practical and educational programs you can buy for the 2068, keep in mind that it is a GAME and a fun one too. There is even an option for kids that just teaches the use of the keyboard without home-row drills. You and your family won't tire of this program overnight.

3 ***HI-RES LANDER***

Why settle for games that use block graphics? The JRC SOFTWARE version of the classic lunar lander features a ship that moves pixel by pixel. With that kind of realism, you have to have a soft touch to land. Plus patience. And it gets harder every round! Fortunately for novice astronauts, there are two levels. There is the regular "hard" option and an "easy" option intended for children. (But you can practice on 'easy' when no one is looking.)

4 *** THREE GAMES PACKAGE ***

Paint and draw with COLORSKETCH. Use your joystick and over a dozen single keystroke commands. Save and load screens easily.

How good are you at avoiding TIMY THE TRASH COMPACTOR? Can you eat all the garbage before he gets you? The large animated characters will entertain children, but adults will get some fun out of it too.

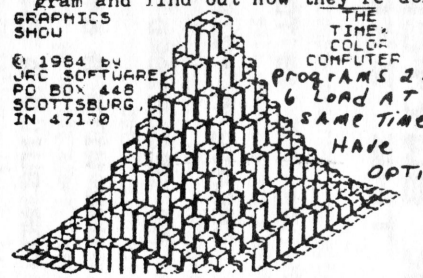
Do you like challenge? DODGE'EM is a fast and difficult race game. Gets progressively harder to master and remembers highest five scores. Plus JRC SOFTWARE added a new surprising twist to this classic race game.

5 *** OSCILLOSCOPE ***

This was a big hit on the 1000. Now it's available for the 2068! It isn't every day that you see real time three dimensional rotation. Although the OSCILLOSCOPE program isn't a real working oscilloscope, it does have similar displays and dozens of patterns are possible. The main difference is that JRC SOFTWARE added a third dimension to the view. Impress everyone with the capability of your TIMEX computer!

6 *** THE GREAT GRAPHICS SHOW ***

Every type of graphics demonstration that can be imagined, from flashing displays to three dimensional cities, has been put together in one fascinating and eye catching program. Explore the 2068 in ways not thought possible. Rather than spending months doing these yourself, you can buy the program and find out how they're done!



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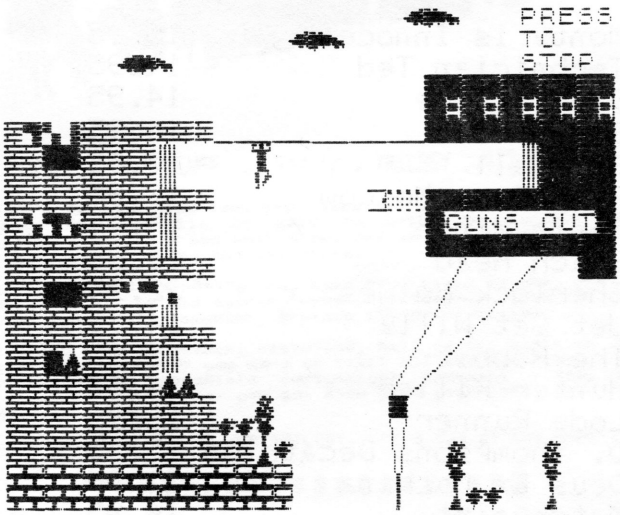

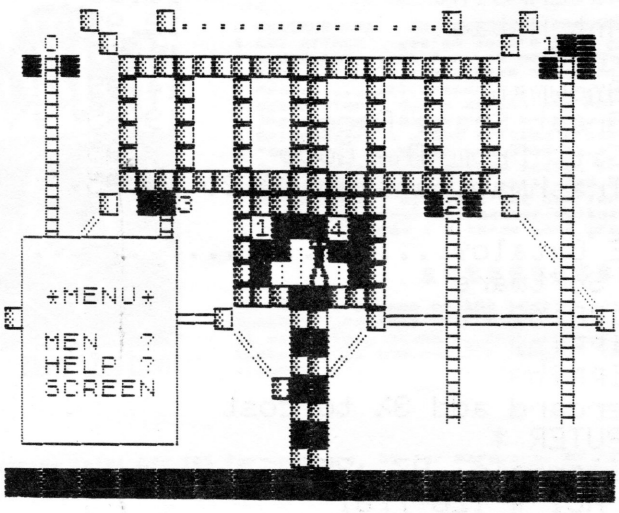

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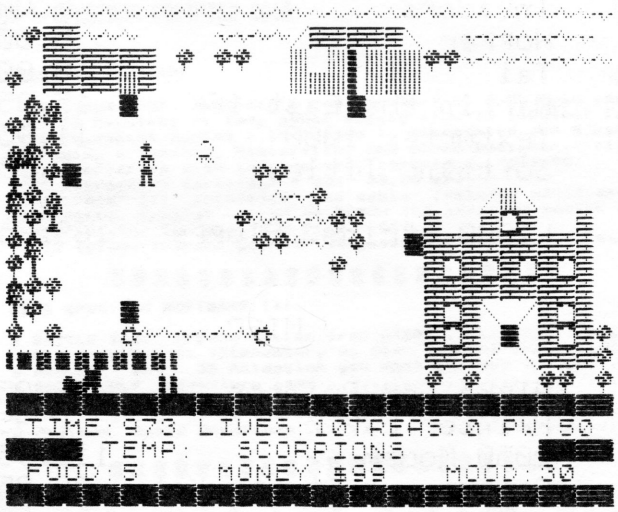
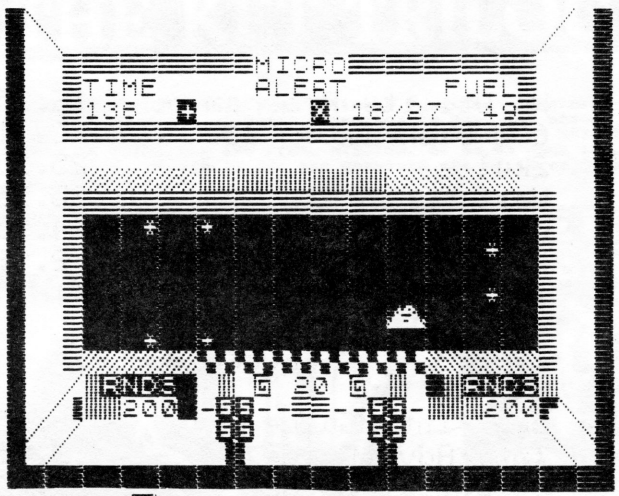
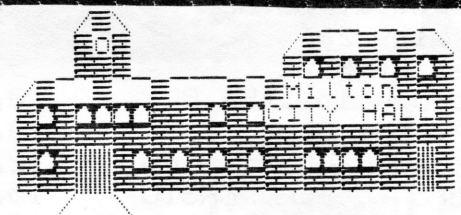
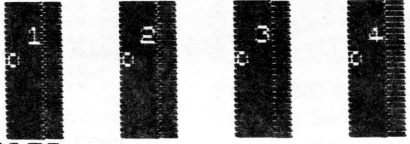






Key the number on the door you wish to enter, 2068'er



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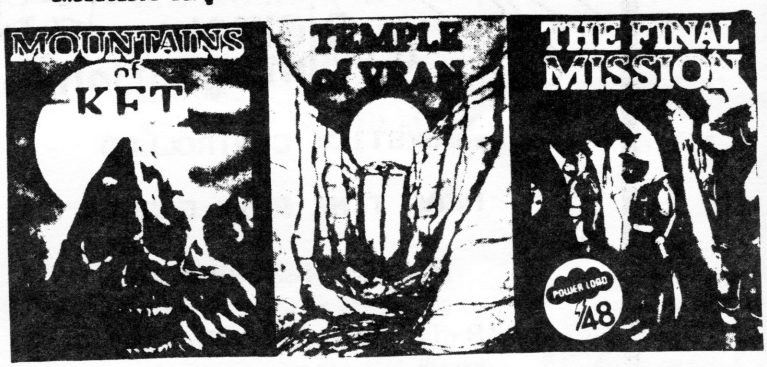

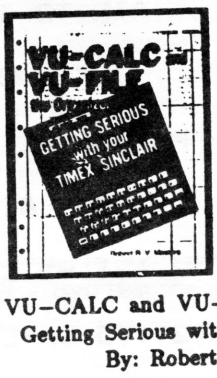

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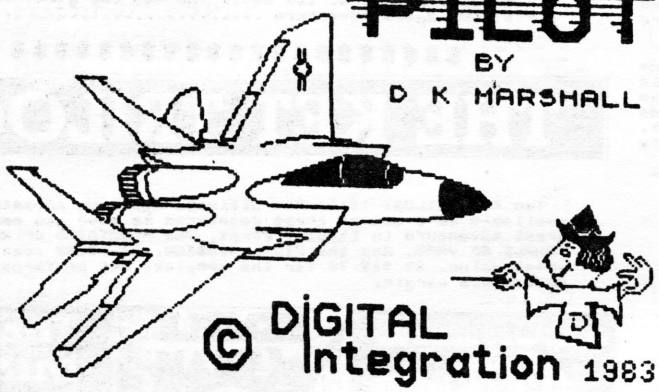

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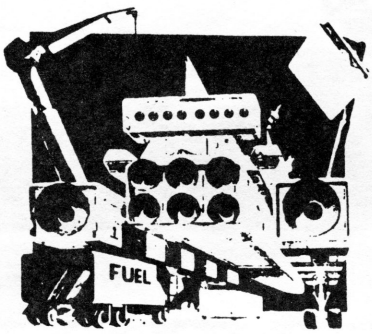

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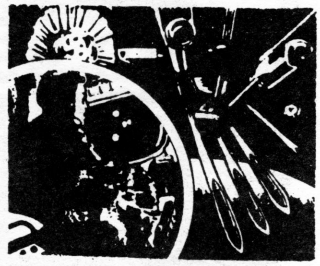

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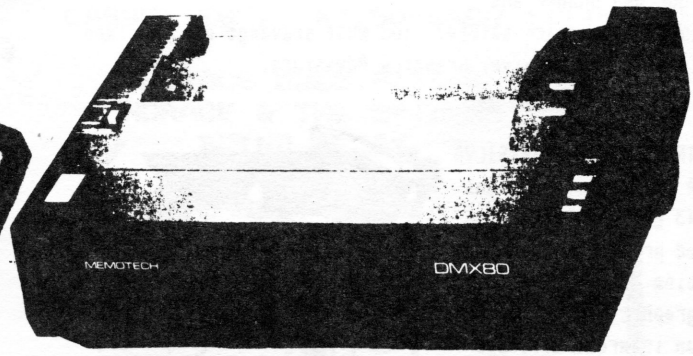

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